DOCUMENT RESUME

ED 348 823 EC 301 445

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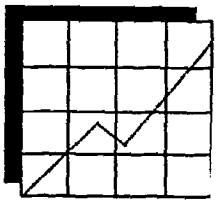
| TITLE | Being First in the World in Science and Mathematics: National Education Goal 4 and Students with Disabilities. Brief Report 5. |
| INSTITUTION | National Center on Educational Outcomes, Minneapolis, MN. |
| SPONS AGENCY | Special Education Programs (ED/OSERS), Washington, DC. |
| PUB DATE | Apr 92 |
| CONTRACT | H159C00004 |
| NOTE | 9p. |
| AVAILABLE FROM | National Center on Educational Outcomes (NCEO), 350 Elliott Hall, 75 E. River Rd., Minneapolis, MN 55455 ($1). |
| PUB TYPE | Viewpoints (Opinion/Position Papers, Essays, etc.) (120) |
| EDRS PRICE | MF01/PC01 Plus Postage. |
| DESCRIPTORS | Academic Achievement; Data Collection; *Disabilities; *Educational Objectives; Elementary Secondary Education; Higher Education; *Mathematics Achievement; Postsecondary Education; Public Policy; Remedial Instruction; Research Needs; *Science Education |
| IDENTIFIERS | *National Education Goals 1990 |

ABSTRACT

This brief report cites the grade of "poor" given to the United States educational system on the fourth of the six National Education Goals proposed by the President and the Governors in 1990. The fourth goal states that "By the Year 2000, U.S. students will be first in the world in science and mathematics achievement." The report then discusses this goal in relation to students with disabilities, addressing the topics of the lack of data on performance of students with disabilities, the emphasis on remedial instruction in science and math for students with disabilities, the low incidence of students with disabilities proceeding to postsecondary education in science or math, methods of monitoring science and math achievement, and information still needed in this area. (JDD)

# Being First in the World in Science and Mathematics

## National Education Goal 4 and Students with Disabilities





**BRIEF REPORT**
**5**

## National Center on Educational Outcomes

The College of Education
UNIVERSITY OF MINNESOTA

April, 1992

## National Education Goal 4

***"By the year 2000, U.S. students will be first in the world in science and mathematics achievement."***

**Objectives:**

- Math and science education will be strengthened throughout the system, especially in the early grades.
- The number of teachers with a substantive background in mathematics and science will increase by 50 percent.
- The number of U.S. undergraduates and graduate students, especially women and minorities, who complete degrees in mathematics, science, and engineering will increase significantly.

From: The National Education Goals Report 1991: Building a Nation of Learners (Executive Summary). Washington, DC: National Education Goals Panel

Our nation has been given a grade of **POOR** on the fourth of the six national education goals proposed by the President and the governors in 1990. International assessments in math and science have ranked the performance of U.S. students near the bottom compared with the performance of youth in other countries.

It is implied that students with disabilities are included in this goal:

> "Achievement in science and mathematics is not limited to those who are born with special talents. In a nation of learners every citizen should demonstrate competence in these subjects."

But, no information is given on how students with disabilities are doing on this goal.

The purpose of this Brief Report is to highlight what we know about students with disabilities in relation to Goal 4 of the six national education goals:

- ✓ How well are students with disabilities **performing** in science and math achievement?
- ✓ How much **emphasis** is placed on science and math in the education of students with disabilities?
- ✓ Are math, science, and engineering the targets of **postsecondary training** for students with disabilities?
- ✓ How are we **monitoring** the science and mathematics achievement of students with disabilities?
- ✓ What do we still **need to know**?

## PERFORMANCE

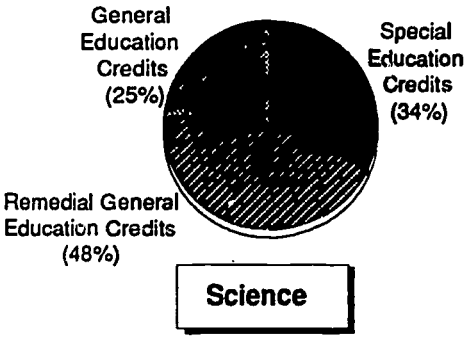
Information on students with disabilities is **not available** from international data bases, nor from most national data bases, because students with disabilities often are not included in these assessments.

## EMPHASIS ON SCIENCE AND MATH

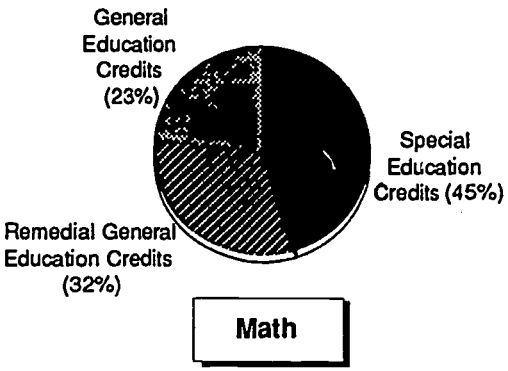
Information on the emphasis placed on science and math in the education of students with disabilities is largely unknown at this time. From the High School Transcript Study (HSTS), we do know that for students with disabilities:

- ✓ Science credits are usually earned in remedial classes
- ✓ Mathematics credits are usually earned in special education or remedial classes

About 38% of science credits are earned in special education, 48% in remedial classes, and 25% in general education.




Source: High School Transcript Study (Hayward, Thorne, & Ha, 1989)



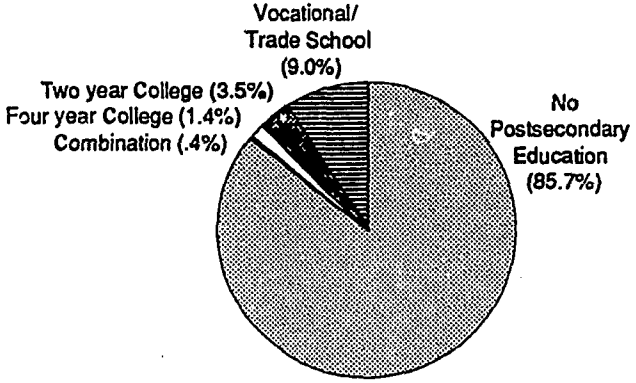

Source: High School Transcript Study (Hayward, Thorne, & Ha, 1989)

About 45% of math credits are earned in special education, 32% in remedial classes, and 23% in general education.

## POSTSECONDARY TRAINING

The National Longitudinal Transition Study (NLTS) has confirmed that few students with disabilities proceed to postsecondary training (Butler-Nalin & Wagner, 1991).

- ✓ More than 85% of students with disabilities do not enroll in any type of postsecondary education
- ✓ Approximately 9% of students with disabilities attend vocational/trade schools, 4% attend 2-year colleges, and 1% attend 4-year colleges




Source: National Longitudinal Transition Study (Butler-Nalin & Wagner, 1991)

We do not have information on the specific focus of coursework for those students who do continue their education after high school. We know from the High School Transcript Study that students with disabilities may not be well prepared for advanced coursework in science or math since they earn 1/3 to 1/2 of their high school science and math credits in remedial classes (Hayward, Thorne, & Ha, 1989).

## MONITORING SCIENCE AND MATH ACHIEVEMENT

Both national and state assessment programs commonly assess mathematics achievement, and less frequently science achievement.

- ✓ The National Assessment of Educational Progress (NAEP) data collection reports performance in science and math by grade and by ethnic group. Data from students with disabilites are not separately reported
- ✓ State data collection efforts assess math more often than science, but few states have the capacity to separately summarize the performance of students with disabilities.

| | Science | Math |
|---|---|---|
| Number states conducting assessments in area | 19 | 38 |
| Number states with capability of separately summarizing performance of students with disabilities | 11 | 24 |

Source: State Special Education Outcomes (NCEO, 1992)

National and state data collection efforts also are characterized by widespread exclusion of students with disabilities (McGrew et al., 1992).

- ✓ NAEP assessments of math and science exclude 40-50% of sampled students with disabilities.
- ✓ State data collection efforts in math and science exclude students with disabilities at very different rates (from 0% to 100%).

International assessments are conducted less frequently than state or national assessments, usually as special studies, and are suspected of even greater exclusionary practices.

## WHAT WE STILL NEED TO KNOW

As we look at being first in the world in science and mathematics achievement, we need to remember that this also means that every citizen will demonstrate competence in these subjects. We must look for **broader concepts of achievement**, so that all citizens have ways to demonstrate their science and math competencies.

We need better information on the in-school science and math coursework of students with disabilities, including the numbers of credits taken and grades received. And, we need to identify the ways in which science and math competencies are demonstrated in the careers and lives of students with disabilities after leaving school.

Finally, we need a better understanding of the exclusionary policies of science and mathematics assessment programs at the state, national, and international levels. If students with disabilities are included in U.S. data, this needs to be clarified as well, and the capacity to look at these data separately made a part of the system.

## Information Sources


Butler-Nalin, P., & Wagner, M. (1991). Enrollment in postsecondary schools. In M. Wagner et al., Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students. Menlo Park, CA: SRI.

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The National Center on Educational Outcomes (NCEO) was established in October, 1990 to work with state departments of education, national policy-making groups, and others to facilitate and enrich the development and use of indicators of educational outcomes for students with disabilities. The Center represents a collaborative effort of the University of Minnesota, the National Association of State Directors of Special Education, and St. Cloud State University. The Center is supported through a Cooperative Agreement with the U.S. Department of Education, Office of Special Education Programs (H159C00004). Opinions or points of view do not necessarily represent those of the U.S. Department of Education or Offices within it.

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